

REMARKS

The Application has been carefully reviewed in light of the Office Action dated January 23, 2004 (Paper No. 8). Claims 25 to 34 and 44 to 58 are in the application, of which Claims 25, 44 and 53 are the independent claims. Claims 1 to 24 and 35 to 43 are being canceled without prejudice or disclaimer of the subject matter. Claims 25, 29 to 34, 44, 46, 48 and 49 are being amended, and Claims 51 to 58 are being added.

Reconsideration and further examination are respectfully requested.

The Office Action raises an objection to Claims 5 and 12, and rejects Claim 12 under 35 U.S.C. § 112, second paragraph. Without conceding the correctness of the objection or rejection, Claims 5 and 12 are being cancelled, rendering the objection and rejection moot.

Claims 1 to 50 are rejected under 35 U.S.C. § 103(a). Independent Claims 1 and 44 are rejected over U.S. Patent No. 5,652,711 (Vennekens) and U.S. Patent No. 5,301,089 (Takashima), and independent Claims 25 and 35 are rejected over Vennekens and U.S. Patent No. 5,412,483 (Ludlow). Claims 2 to 24, 26 to 34, 36 to 43 and 45 to 50 are rejected over Vennekens in various combination with Takashima, Ludlow, U.S. Patent No. 5,819,038 (Carleton), U.S. Patent No. 6,336,124 (Alam), U.S. Patent No. 4,912,491 (Hoshino), U.S. Patent No. 4,975,862 (Keller), U.S. Patent No. 5,557,297 (Sharp), U.S. Patent No. 5,270,769 (Sato), U.S. Patent No. 5,987,226 (Ishikawa). Without conceding the correctness of the rejection, Claims 1 to 24 and 35 to 43 are cancelled. Reconsideration and withdrawal of the rejection of the remaining claims are respectfully requested.

Claims 25 to 34, 51 and 52

According to the invention, a printing system receives page description language format data including attribution information, which indicates at least a data structure of plural pages and types of objects which constitute the page description language format data. The attribution information included in the received page description language format data is analyzed and a page is segmented into objects defined by the data, and each object in the received page description language format data is independently assigned to a respective one of a plurality of processors as conversion process jobs for converting the object into image data to completion of the conversion process for one page.

By virtue of this arrangement, a page is segmented into objects defined by the page description language format data, and the object segments are then independently converted to image data to generate a page.

Claim 25 has, among its features, the features of: 1) analyzing attribution information included in a received page description language format data to segment a page into objects defined by the page description language format data, 2) independently assigning the identified objects to a respective one of a plurality of processors as jobs of conversion processes converting the object into image data, 3) performing the assignment of the objects to complete the conversion processes for one page, 4) receiving bit map image data from the plurality of processors without regard to a page order and storing the received data in memory, and 5) reconstructing the bit map image data stored in the memory to the printing engine.

Neither Vennekens nor Ludlow, either alone or in any permissible combination is seen to disclose or to suggest the above features.

Vennekens is seen to describe using parallel processing to convert a PDL data stream into an intermediate data stream by first creating independent PDL data stream segments that correspond to a region, such as a page, of a physical medium. Vennekens is seen to assign parallel processing based on units of a physical medium, and is not seen to analyze attribution information in page description language format data to segment a page into objects defined by the page description language format data and to assign parallel processing based on objects defined in page description language format data.

Ludlow has been reviewed and is not seen to remedy the deficiencies of Vennekens.

Neither Vennekens nor Ludow, either alone or in combination, if any combination is even permissible, is seen to disclose the features of: 1) analyzing attribution information included in a received page description language format data to segment a page into objects defined by the page description language format data, 2) independently assigning the identified objects to a respective one of a plurality of processors as jobs of conversion processes converting the object into image data, 3) performing the assignment of the objects to complete the conversion processes for one page, 4) receiving bit map image data from the plurality of processors without regard to a page order and storing the received data in memory, and 5) reconstructing the bit map image data stored in the memory to the printing engine.

Therefore, for at least the foregoing reasons, Claim 25 is believed to be in

condition for allowance.

The art applied against Claims 26 to 34, 51 and 52 has been reviewed and is not seen to remedy the deficiencies noted with respect to Vennekens and Ludlow.

Accordingly, Claims 26 to 34, 51 and 52, which are each dependent from independent Claim 25 discussed above, are therefore believed patentable.

Claims 44 to 50

According to the invention, a printer controller includes a plurality of parallel developing means for developing print data into image data. A receiving means receives a plurality of pages of print data, the plurality of print pages have a designated order. Color component data and object data are generated, and a control means assigns color component data and object data to the plurality of parallel developing means according to a respective type of color and object, and the parallel developing means generate image data, which is stored independent of the page order. The stored image data is then output based on page order.

By virtue of this arrangement, a page is segmented into color component and object data as defined by the page description language format data, and conversion of an object is parallelized, in accordance with its color component data, such that the object and the color component data is converted to image data using the parallel developing means.

Claim 44 has, among its features, the features of: 1) receiving a plurality of pages having a designated order, 2) generating a plurality of object data and color

component data corresponding to each color component of the object data from each received page of print, 3) assigning the color component data and the object data to a plurality of developing means according to the object data and to a respective type of the color component data so as to generate image data from the color component data and object data, 4) storing the image data independent of page order, and 5) output the stored image data based on page order.

Neither Vennekens nor Takashima, either alone or in any permissible combination is seen to disclose or to suggest the above features.

As described above, Vennekens is seen to describe using parallel processing to convert a PDL data stream into an intermediate data stream by first creating independent PDL data stream segments that correspond to a physical medium such as a page. Thus, Vennekens is seen to assign parallel processing based on the physical medium, and is not seen to assign parallel processing based on objects identified in page description language format data.

In addition, and as conceded in the Office Action, Vennekens fails to disclose generating component data for each color component and assigning the color component data to a plurality of developing means based on a respective type of color component. Accordingly, Applicants submit that Vennekens also fails to disclose generating object data and color component data corresponding to each color component of the object data from each page of print data, and assigning component data and object data to a plurality of developing means according to the object data and a respective type of the color component data.

Takashima is not seen to remedy the deficiencies of Vennekens. Takashima is seen to describe a parallel processing system, with processing units having memory, arranged around a bus structure. Commencing at col. 4, line 52, Takashima describes performing parallel processing of color image data using the processing system, wherein program code for performing color image processing is parallelized into segments of program code for execution by processors in parallel. Takashima is therefore seen to describe parallelization based on segments of executable code.

Takashima is not seen to disclose generating object data and color component data corresponding to each color component of the object data from each page of print data, and assigning said component and object data to a plurality of developing means according to the object data and a respective type of the color component data.

Neither Vennekens nor Takashima, either alone or in combination, if such combination is even permissible, is seen to disclose the features of: 1) receiving a plurality of pages having a designated order, 2) generating a plurality of object data and color component data corresponding to each color component of the object data from each received page of print, 3) assigning the color component data and the object data to a plurality of developing means according to the object data and to a respective type of the color component data so as to generate image data from the color component data and object data, 4) storing the image data independent of page order, and 5) output the stored image data based on page order.

Therefore, for at least the foregoing reasons, Claim 44 is believed to be in condition for allowance.

The art applied against Claims 45 to 50 has been reviewed and is not seen to remedy the deficiencies noted with respect to Vennekens and Takashima. Accordingly, Claims 45 to 50, which are each dependent from independent Claim 44 discussed above, are therefore believed patentable.

Claims 53 to 58

According to the invention, a printing apparatus having a plurality of parallel developing means for developing print data into image data receives a plurality of pages of print data, the format of the received data is judged and the print data is assigned to a developing means based on the judged result.

By virtue of this arrangement, using a plurality of parallel developing means, print data is assigned to a developing means for developing into image data based on a determined format of the print data.

Claim 53 has, among its features, the features of: 1) receiving a plurality of pages of print data, 2) judging a format of the received print data, 3) assigning, based on the judged format, the print data to a developing means from a plurality of developing means to develop the print data into image data.

None of the applied art is seen to disclose these features. Accordingly, Claim 53 is believed to be in condition for allowance.

Claims 54 to 58 are each dependent from the independent claims discussed above and are therefore believed patentable for the same reasons. Because each dependent claim is also deemed to define an additional aspect of the invention, however, the

individual consideration of each on its own merits is respectfully requested.

CONCLUSION

In view of the foregoing, the entire application is believed to be in condition for allowance, and such action is respectfully requested at the Examiner's earliest convenience.

Applicants' undersigned attorney may be reached in our Costa Mesa, California office by telephone at (714) 540-8700. All correspondence should be directed to our address given below.

Respectfully submitted,


Attorney for Applicants

Registration No. 39,000

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-2200
Facsimile: (212) 218-2200

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